FIG. 1.

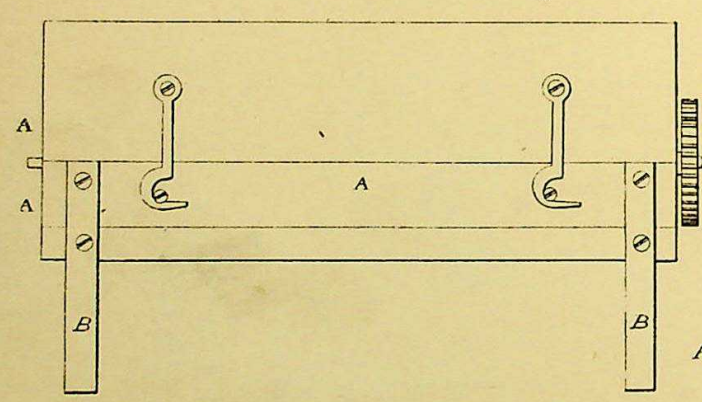


FIG. 3.

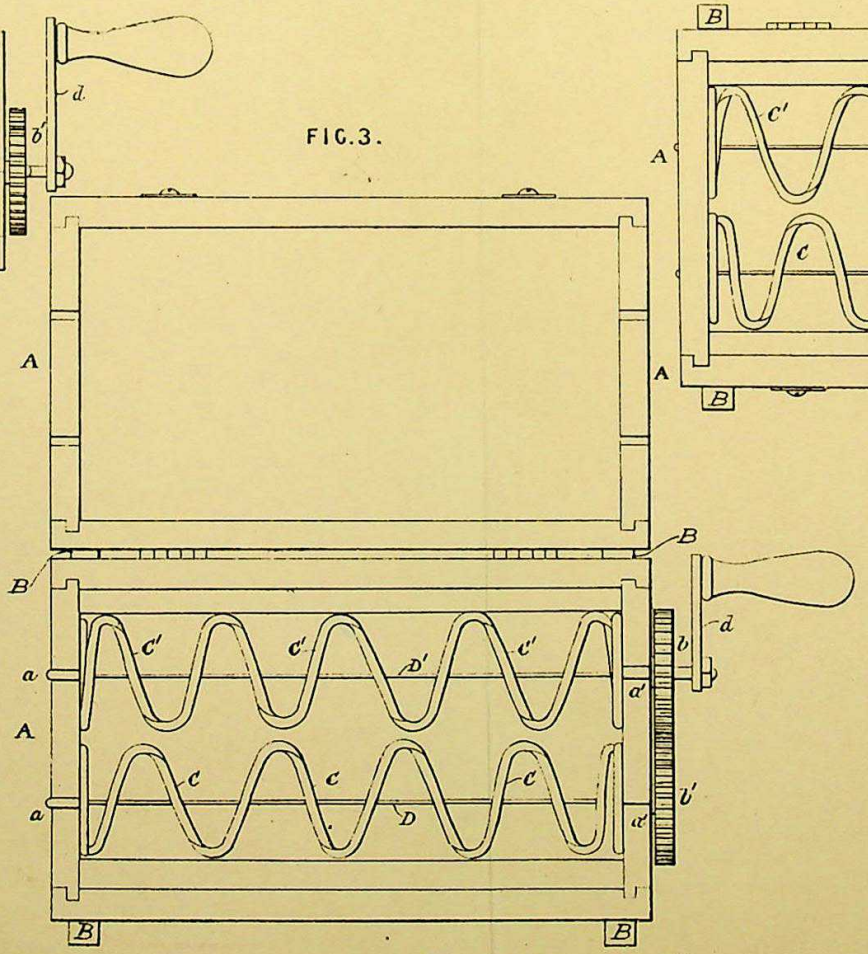
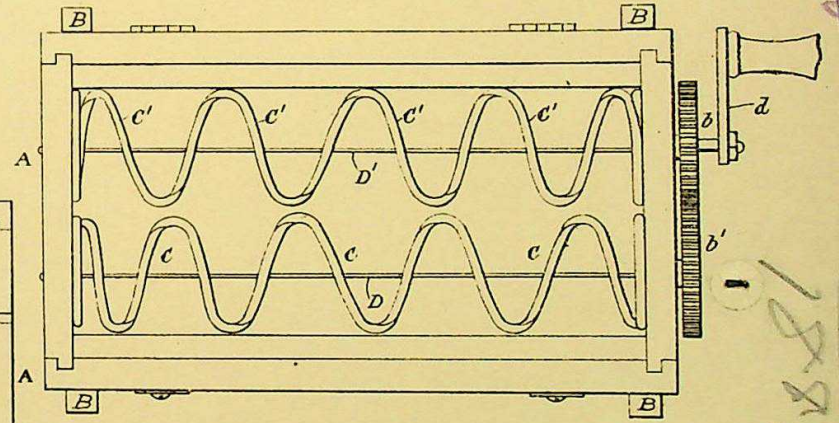


FIG. 2.



Mixers and Kneaders

A.D. 1884, 4th MARCH. N° 4342.

Improvements in Machines or Apparatus for Mixing or Kneading Dough or similar Material.

[*Communicated from abroad by Oliver Rice Chase, of Boston, Massachusetts, United States of America.*]

PROVISIONAL SPECIFICATION.

I HENRY HARRIS LAKE of the firm of Haseltine Lake & C° Patent Agents Southampton Buildings London in the County of Middlesex do hereby declare the nature of said invention for "IMPROVEMENTS IN MACHINES OR APPARATUS FOR MIXING OR KNEADING DOUGH OR SIMILAR MATERIAL" to be as follows:—

The object of this invention is to provide a simple, cheap and effective apparatus whereby the mixing or kneading of dough or similar material may be accomplished with far greater facility and perfection than by devices of this character as heretofore constructed, and my invention consists in the peculiar construction, combination and arrangement of the parts as hereinafter described.

In carrying the said invention into practice I provide a rectangular box, open at top (but if desirable it may be provided with a cover) and of any desirable capacity to receive the materials to be mixed or kneaded, the said box being supported upon legs. This box I prefer to make in two parts so that one part of the same can be turned back to enable the mixers hereinafter described to be readily inserted within, or removed from, the mixing chamber whenever it may be desirable.

Within the interior, and near the bottom, of the box I arrange two spiral blades or bars which I term "mixers" and which I prefer to make of a triangular or wedge shape in cross section, although such form is not essential, as they may have any desirable shape transversely. These blades or bars I make or cast of a single piece of metal and terminate each end thereof in a straight portion, the same extending outwards in a line axially of the spiral blades. These portions constitute the journals of the blades and are supported in bearings in the ends of the kneading trough or receptacle. Each of these blades or mixers has affixed to one of its journals extending through the end of the box, a spur gear wheel, such wheels engaging with each other; one of the journals or shafts is extended beyond the end of the box and is provided with a crank or pulley to which motion may be imparted from any suitable motor.

I also provide a thin flat bar which may be affixed to the periphery of both the spiral blades the same extending longitudinally thereof and serving to scrape the

material from the sides and bottom of the mixing chamber, while at the same time it aids in elevating the mass of dough.

The operation is as follows :—If we suppose the materials to form the dough to have been put into the box or mixing chamber and the blades or mixers to have been put in revolution, by means of the crank or pulley, it will be evident that each of the mixers will rotate in an opposite direction and by their action will tend to divide the mass of materials into two attenuated, rope-like portions, and that such portions, by the spiral form or action of the blades, will not only be carried laterally around and forced in opposite directions toward opposite ends of the chamber but be at the same time moved inward. Each portion, on reaching the end of the box, will be impeded thereby in its further horizontal movement, and being acted on by the forward impulse of the mass behind it, will, of necessity, be forced (as its only free way of escape) upward, and by its gravitating tendency will be drawn downward and inward, and fall between the rope-like portions being formed by the action of the blades or mixers ; the continuous action of the latter will cause such end portions and the portions being formed by the blades to be continuously intertwisted or braided somewhat like the strands on a braiding machine. This operation being carried on while the machine is in action will cause a continuous breaking up and changing of the parts of the mass and thereby effect a most expeditious and perfect commingling or kneading of the dough, while the scraping bars or plates will aid in scraping off any material which may lodge on the sides or bottom of the mixing chamber.

I would remark that I do not consider the scraping bars or plates essential to the effective operation of the machine, but they may be employed if desirable.

By my peculiar construction and operation of the spiral mixers not only a perfect mixing of the materials is effected but a complete aeration of the mass is attained.

Dated this 4th day of March 1884.

HASELTINE, LAKE & Co.,
For the Applicant.

COMPLETE SPECIFICATION.

I, HENRY HARRIS LAKE, of the firm of Haseltine, Lake & C°, Patent Agents, Southampton Buildings, in the County of Middlesex, do hereby declare the nature of my invention for "IMPROVEMENTS IN MACHINES OR APPARATUS FOR MIXING OR KNEADING DOUGH OR SIMILAR MATERIAL" and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

The object of this invention is to provide a simple and cheap machine or apparatus, whereby the mixing or kneading of dough or similar materials may be accomplished with much greater facility and efficiency than by apparatus as heretofore constructed for this purpose. The said invention comprises various improvements as hereinafter set forth.

In the accompanying drawing, I have shewn how the said invention may be conveniently and advantageously carried into practice.

Figure 1 is a front elevation, and

Figure 2 a plan or top view of the improved machine or apparatus.

Figure 3 is a plan or top view of the said apparatus with a portion thereof turned back for the purpose hereinafter explained.

A indicates a rectangular box or trough, which is open at the top, but which may, if desired, be provided with a lid or cover. This box or trough is made of any suitable capacity to receive the materials to be mixed or kneaded, and is supported upon legs B. It is preferably divided horizontally into two parts as shewn, so that one of the said parts can be turned back to permit the removal and replacement of the blades or mixers hereinafter described when necessary or desirable.

Within, and near the bottom of, the box A I arrange two spiral blades or bars C, C^1, which I term the "mixers," and which I prefer to make triangular or wedge-shaped in transverse section, although such form is not essential to the proper working of the machine. These blades or bars are of metal, and each of them is cast or otherwise formed in a single piece. At the ends of the said blades are straight portions a, a^1 extending outwards in line with the axis of the spiral or main portion of the blade. These portions a, a^1, constitute the journals of the blades and are supported in bearings in the ends of the kneading trough or receptacle A, as shewn in Figure 3. Each of the said blades or mixers has fixed on the extremity of the portion a^1 outside the box or trough A a spur-wheel b or b^1. These wheels gear with each other, and the portion a^1 of the blade C^1 is extended beyond the spur-wheel b and provided with a crank-handle d or a pulley whereby the said blades may be rotated in opposite directions by hand or other power. D, D^1 are thin flat blades or bars secured to the peripheries of the spiral blades C, C^1 and extending from end to end thereof. These flat bars serve to scrape the material from the sides and bottom of the mixing chamber, and, at the same time, assist in elevating the mass of dough or other material.

The operation of the improved machine or apparatus is as follows, that is to say:—Assuming that the materials to be mixed or kneaded have been put into the box or mixing chamber A, when the blades or mixers C, C^1 are rotated in opposite directions by means of the aforesaid crank or pulley, they will tend to divide the mass into two attenuated rope-like portions. These portions, by reason of the spiral form and action of the blades, will not only be rotated and forced in opposite directions towards one or the other end of the chamber, but will, at the same time, be moved inward. Each of the said portions, on reaching the end of the box, will have its horizontal motion impeded thereby, and, being acted upon by the forward

impulse of the mass behind it, will of necessity be forced (as its only free way of escape) upward, and will then be drawn downward by gravitation and fall between the rope-like portions being formed by the action of the blades or mixers, with which portions it will, by the continuous action of the said blades, be intertwisted or braided somewhat like the strands on a braiding machine. While the machine is in action, therefore, a continuous breaking up and change of position of the parts of the mass will take place, and a very expeditious and perfect commingling or kneading of the dough will thus be effected, while the bars or plates D, D^1 will scrape off any material which may lodge on the sides or bottom of the mixing chamber.

I do not consider the plates D, D^1 essential to the effective operation of the machine, and they may, if desired, be dispensed with. Moreover, I may, if desired, employ more than two of the spiral blades or mixers.

By the above described peculiar construction and arrangement of the spiral mixers, not only is a perfect mixing of the materials provided for, but a complete aëration of the mass is ensured.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is:—

First. In a machine or apparatus for mixing or kneading dough or similar materials, the combination of two or more spiral blades or mixers, substantially as described, to operate as, and for the purpose, set forth.

Second. The combination, with each, or either, of the said spiral blades or mixers, of a flat blade or bar, substantially as, and for the purposes, set forth.

Third. The improved machine or apparatus consisting of the parts constructed and combined substantially as described with reference to the accompanying drawing and operating as, and for the purpose, set forth.

Dated this 3rd day of December 1884.

HASELTINE, LAKE & Co.,
For the Applicant.

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